Point, Counterpoint Over Climate Change

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**By Bruce W. Fraser**

World leaders gather in Copenhagen, Denmark, on December 7 to hammer out policy on one of the most vigorously debated issues of today: climate change. Central to the debate is the question whether global warming is a threat to the planet, and if it is how fast is it happening and what are the solutions.

From Bangladesh to Boston, there is a lot at stake at this meeting. India and the European Union are trying to narrow their differences on climate change at their annual summit this week. Meanwhile, Europe is upping the pressure on the United States to bring a climate change protocol to the table in Copenhagen. President Obama has been pushing Congress to pass climate change legislation before that meeting, but whether that will happen is questionable. U.S. Republican lawmakers recently boycotted a committee meeting on an Obama-backed bill to set U.S. requirements on carbon emissions. Republicans say the plan is too expensive and isn't the best way to deal with climate change.

*FA Green*asked two experts on opposite sides of the debate to discuss the scientific and political aspects of climate change: Patrick J. Michaels, a Senior Fellow in Environmental Studies at the libertarian Cato Institute, and Professor Andrew Dessler of Texas A&M. Michaels is a contributing author and reviewer of the United Nations Intergovernmental Panel on Climate Change (IPCC), which was awarded the Nobel Prize in 2007. Dessler was a senior policy analyst in the Clinton White House Office of Science and Technology Policy and co-author of *The Science and Politics of Global Climate Change: A Guide to the Debate.*

Both accept that global warming is occurring, but where they part company is over the rate at which warming is taking place and over policies of how to solve the problem.

**FA Green:** Is the climate warming?

**Andrew Dessler:** We have much evidence that the earth is in the midst of a warming trend that's been occurring for about 400 years, with particularly rapid warming over the last few decades. The evidence includes data from thermometers; sea ice; glaciers; ocean temperatures; proxy data, such as tree rings; and satellites. The warming trend has varied year to year, but pretty much every decade over this period has been warmer than the previous one.

**Patrick Michaels:** There's no doubt that the surface temperature of the planet is about 0.8 C (1.4 degrees F) warmer than it was at the beginning of the 20th century. Recent warming is consistent with changes in the emission of greenhouse gases, as well as changes in the sun and the earth's climate system.

**FA Green**: Why is the climate warming? If not, please explain.

**Patrick Michaels:** Though there hasn't been any net warming since the late 1990s, the warming of the late 20thcentury has more of a human footprint on it than the warming of the early 20thcentury.

People often pick 1998 as a starting point for lack of warming, but that's extremely unfair because the very strong el Nino in 1998 caused a real spike in the temperature record. But since that cycle finished in 2000, there is still no net temperature change. However, this does not mean that carbon dioxide suddenly stopped warming the atmosphere. Rather, the el Ninos became very few, far between, and very weak, and the sun for unknown reasons became very cold, though it may be starting to warm now.

There are other problems with our measurements of warming. Many weather stations are not in uniform and controlled environments, so the measurements of temperatures are imperfect. Our studies have shown that this causes a warming bias of a few hundreds of a degree Celsius in the temperature record.

**Andrew Dessler:** The general opinion of most scientists is that more than half of warming over the last half century is very likely due to human activity. They arrived at this conclusion by considering all the possible reasons that the climate may be warming. Some are natural, e.g., changes in the Sun, national oscillations, and some are manmade, in particular increases in greenhouse gases. For the last few decades, we have observations that allow us to eliminate the natural causes of climate change.

The evidence implicating greenhouse gases, on the other hand, is extremely strong. There are strong theoretical reasons to expect an increase in greenhouse gases to warm the climate. And looking historically across the last 100 million years or so, the data numbers show that changes in greenhouse gases have affected the atmosphere. That's why we're reasonably confident the earth is presently warming due to human emissions of greenhouse gases.

**FA Green:** What is your best estimate of warming over the next century?

**Andrew Dessler:** Predictions of the future are always difficult. But if we make the assumption that carbon dioxide emissions follow present trends, which is often referred to as a business-as-usual scenario, we will end up with carbon dioxide levels double or triple preindustrial values by the end of the century. The mainstream view is that this will lead to global and annual average temperature increases for the Earth of 2.5 - 3 degrees C (4.5-5.4 degrees F) by the end of the century. If one considers that the last ice age was only 5.7 degrees C colder than today, warming of a few degrees over the next 100 years should compel our attention.

**Patrick Michaels:** The second scientific assessment report of the Intergovernmental Panel on Climate Change (IPCC), published in 1996, had two competing explanations of recent temperatures. It said that left to their own, climate models tend to predict too much warming, unless something, such as sulfate aerosols that go in the atmosphere along with carbon dioxide, was interfering with it, or, and this is an important alternative, the sensitivity to carbon dioxide has been overstated. There is evidence for the latter.

The increase in percent of carbon dioxide at 1% per year we just heard about is wrong. The increase has been averaging very close to 0.05% per year, with surprisingly little variation, over the last three decades. It's likely that the mean prediction from the models is too high simply because the CO2 is not going in at that 1% rate.

The other problem, though, is the greenhouse gas called methane, which has been forecast since the late 1980s to increase constantly in the atmosphere. Instead, the rate increase has slowed and has actually gone below zero in some years. And methane is 20 times stronger than the greenhouse gas of carbon dioxide.

Bottom line: The warming of the 21st century is likely to be at, or possibly even below, the low end of ranges given by the IPCC.

The observed temperature trajectory indicates about 1.6 degrees Celsius over the course of the 21st century, which is again at the low end of estimates made[.](http://www.fa-mag.com/" \l "_msocom_1" \o "_msoanchor_1) So the arguments that we're at a tipping point really begin to lose their effectiveness and their punch.